	Application No.	Applicant(s)
Notice of Allowability	09/887,759	KIERNAN ET AL.
	Examiner	Art Unit	
	Jacques Veillard	2165	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspond nce address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the applicant's amendment filed on 5/01/2006*.

2. ☒ The allowed claim(s) is/are *1-5, 7-13, 15-21, 23, and 24*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *5/31/2006* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

DETAILED ACTION

1.   This action is responsive to the applicant's amendment filed on May 01, 2006.

2.   Claims 2, 10, 17, and 18 have been amended.

3.   Claims 1-24 are pending and presented for examination.

EXAMINER'S AMENDMENT

4.   An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

      Authorization for this examiner's amendment was given in a telephone interview with

attorney George H. Gate (Reg. No. 33,500) the undersigned for applicant(s) on May 31, 2006.

      The application has been amended as follows:

In the claims:

Please cancel claims 6, 14 and 22, and amend claims 1, 7, 8, 9, 15, 16, 17, 23 and 24 as follows:

1. (CURRENTLY AMENDED) A method of simplifying a query in a computer to retrieve data

from a database, comprising:

      (a) determining whether a query includes a self join that is transitively derived through

table expressions having UNION operators; and

(b) simplifying the query to eliminate the table expressions and to reduce the query to an equivalent query over tables, when the query includes the self-join that is transitively derived through the table expressions having the UNION operator;

(c) wherein the determining step (a) and simplifying step (b) are implemented as a rule-based transformation, the determining step (a) comprises a condition part of the rule, and the simplifying step (b) comprises an action part of the rule that is performed when the condition part is true.

6. (CANCELED)

7. (CURRENTLY AMENDED) The method of claim [[6]] 1, wherein the condition part of the rule requires:

(1) that a quantifier Qi in the query is a FOR EACH quantifier;

(2) that Qi is defined within a SELECT operator that implements an inner join;

(3) that there are at least two quantifiers Qi and Qj in the SELECT operator;

(4) computing equivalence classes among columns in the SELECT operator, wherein the equivalence classes are divided into three classes:

(A) Type 1 equivalence classes are sets of quantified columns over quantifiers other than Qi;

(B) Type 2 equivalence classes are sets of quantified columns that reference Qi and at least one other quantifier Qj;

(C) Type 3 equivalence classes are sets of quantified columns that only reference Q_i;

(5) for each set S_i of Type 2 equivalence classes, separating quantified columns according to the quantifiers over which they range;

(6) enumerating all combinations of quantified columns KEY_1, ..., KEY_n over Q_i;

(7) retaining only those Q_i where KEY_i comprises key columns;

(8) computing the derivation of Superset columns from which KEY_i is derived and adding them to KEY_i;

(9) for each quantifier Q_j in the SELECT operator where $Q_j \diamond Q_i$, if Q_j has a quantified column in each Type 2 equivalence class:

(A) computing the derivation of Subset columns from which Q_i is derived;

(B) for each derivation in Q_i:

(i) for all lists of quantified columns in the derivation:

(I) the list of quantified columns matches at least one list of quantified columns in KEY_i.

8. (CURRENTLY AMENDED) The method of claim [[6]] 1, wherein the action part of the rule requires:

(1) for each Type 2 equivalence class:

(a) replacing all occurrences of quantified columns over Q_i with quantified columns in the same Type 2 equivalence class;

(2) removing Q_i from the query.

9. (CURRENTLY AMENDED) A computer-implemented apparatus for simplifying a query,

comprising:

      a computer, wherein the query is performed in the computer to retrieve data from a

database;

      logic, performed by the computer system, for:

          (a) determining whether a query includes a self join that is transitively derived

through table expressions having the UNION operators; and

          (b) simplifying the query to eliminate the table expressions and to reduce the

query to an equivalent query over tables, when the query includes the self join that is

transitively derived through the table expressions having the UNION operators;

          (c) wherein the logic for determining (a) and logic for simplifying (b) are

implemented as a rule-based transformation, the logic for determining (a) comprises a

condition part of the rule, and the logic for simplifying (b) comprises an action part of the

rule that is performed when the condition part is true.

14. (CANCELED)

15. (CURRENTLY AMENDED) The apparatus of claim [[14]] 9, wherein the condition part of

the rule requires:

      (1) that a quantifier Qi in the query is a FOR EACH quantifier;

      (2) that Qi is defined within a SELECT operator that implements an inner join;

      (3) that there are at least two quantifiers Qi and Qj in the SELECT operator;

(4) computing equivalence classes among columns in the SELECT operator, wherein the equivalence classes are divided into three classes:

(A) Type 1 equivalence classes are sets of quantified columns over quantifiers other than Q_i;

(B) Type 2 equivalence classes are sets of quantified columns that reference Q_i and at least one other quantifier Q_j;

(C) Type 3 equivalence classes are sets of quantified columns that only reference Q_i;

(5) for each set S_i of Type 2 equivalence classes, separating quantified columns according to the quantifiers over which they range;

(6) enumerating all combinations of quantified columns KEY_1, ..., KEY_n over Q_i;

(7) retaining only those Q_i where KEY_i comprises key columns;

(8) computing the derivation of Superset columns from which KEY_i is derived and adding them to KEY_i;

(9) for each quantifier Q_j in the SELECT operator where $Q_j \Leftrightarrow Q_i$, if Q_j has a quantified column in each Type 2 equivalence class:

(A) computing the derivation of Subset columns from which Q_i is derived;

(B) for each derivation in Q_i:

(i) for all lists of quantified columns in the derivation:

(I) the list of quantified columns matches at least one list of quantified columns in KEY_i.

16. (CURRENTLY AMENDED) The apparatus of claim [[14]] 9, wherein the action part of the

rule requires:

(1) for each Type 2 equivalence class:

        (a) replacing all occurrences of quantified columns over Qi with quantified

columns in the same Type 2 equivalence class;

    (2) removing Qi from the query.

17. (CURRENTLY AMENDED) A device embodying logic for simplifying a query in a

computer to retrieve data from a database, the logic comprising:

    (a) determining whether a query includes a self join that is transitively derived through

table expressions having the UNION operators; and

    (b) simplifying the query to eliminate the table expressions and to reduce the query to an

equivalent query over tables, when the query includes the self join that is transitively derived

through the table expressions having the UNION operators;

    (c) wherein the determining step (a) and simplifying step (b) are implemented as a rule-

based transformation, the determining step (a) comprises a condition part of the rule, and the

simplifying step (b) comprises an action part of the rule that is performed when the condition

part is true.

22. (CANCELED)

23. (CURRENTLY AMENDED) The device of claim [[22]] 17, wherein the condition part of

the rule requires:

(1) that a quantifier Qi in the query is a FOR EACH quantifier;

(2) that Qi is defined within a SELECT operator that implements an inner join;

(3) that there are at least two quantifiers Qi and Qj in the SELECT operator;

(4) computing equivalence classes among columns in the SELECT operator, wherein the equivalence classes are divided into three classes:

    (A) Type 1 equivalence classes are sets of quantified columns over quantifiers other than Qi;

    (B) Type 2 equivalence classes are sets of quantified columns that reference Qi and at least one other quantifier Qj;

    (C) Type 3 equivalence classes are sets of quantified columns that only reference Qi;

(5) for each set Si of Type 2 equivalence classes, separating quantified columns according to the quantifiers over which they range;

(6) enumerating all combinations of quantified columns KEY1, ..., KEYn over Qi;

(7) retaining only those Qi where KEYi comprises key columns;

(8) computing the derivation of Superset columns from which KEYi is derived and adding them to KEYi;

(9) for each quantifier Qj in the SELECT operator where Qj <> Qi, if Qj has a quantified column in each Type 2 equivalence class:

    (A) computing the derivation of Subset columns from which Qi is derived;

    (B) for each derivation in Qi:

        (i) for all lists of quantified columns in the derivation:

(I) the list of quantified columns matches at least one list of

quantified columns in KEYi.

24. (CURRENTLY AMENDED) The device of claim [[22]] 17, wherein the action part of the

rule requires:

(1) for each Type 2 equivalence class:

(a) replacing all occurrences of quantified columns over Qi with quantified

columns in the same Type 2 equivalence class;

(2) removing Qi from the query.

Allowable Subject Matter

5.   In view of Applicant's amendment and remarks, filed May 01, 2006, Examiner has fully

considered the amendment and remarks and believes that they are deemed to be persuasive.

6.   Claims 1-21 are allowed in light of the applicant's arguments and in light of the prior art

made of record.

Reasons for Indicating Allowable Subject matter

7.   The following is an examiner's statement of reasons for allowance: Applicant particularly

discloses a method and a device embodying logic for simplifying a query in a computer to

retrieve data from a database in a database environment by a) determining whether a query

includes a self join that is transitively derived through table expression having union operators in

order to; b) simplifying the query to eliminate the table expressions to reduce that query to an equivalent query over tables, when the query includes the self join that is transitively derived through table expression having union operators. The examiner, upon searching a variety of databases, respectfully submits that the step c) -- *wherein the determining step (a) and simplifying step (b) are implemented as a rule-based transformation, the determining step (a) comprises a condition part of the rule, and the simplifying step (b) comprises an action part of the rule that is performed when the condition part is true*-- as embodied in independent claims 1, 9, and 17, in context with the other limitations of the claims was not described by, would not have been obvious over, nor would have been fairly suggested by the prior art of record.

The dependent claims 2-5, 7, 8, 10-13, 15, 16, 18-21, 23, and 24, being further limiting to the independent claims, definite and fully enabled by the specification are also allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Points of Contact

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques Veillard whose telephone number is (571) 272-4086. The examiner can normally be reached on Mon. to Fri. from 9 AM to 4:30 PM, alt. Fri. off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on (571) 272- 4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

J.V
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Jacques Veillard
Patent Examiner TC 2100

June 01, 2006